A Marked-up copy of the Claims

1. (amended) A process for the fractionation or purification of polydisperse water soluble polymers that are composed of repeating units that do not contain functional groups capable of carrying a charge at neutral pH comprising:
    a. dissolving a known amount of the polymer in water to form a clear solution,
    b. equilibrating the solution at a temperature that allows the formation of an opaque solution when an aqueous soluble, multivalent salt is added to the solution,
    c. adding an aqueous soluble multivalent [extraction]salt to the solution,
    d. maintaining the solution at the temperature of step b until two phases form in the solution, such that the lower phase contains the lower molecular weight polymer molecules,
    e. removing the lower phase,
    f. replacing the volume of the lower phase by adding water to the remaining solution,
    g. repeating steps b through f the required number of times to cause the desired fractionation,
    h. isolating the upper phase of the final extraction,
    i. removing the water and multivalent [extraction] salt to yield a fractionated polymer having a higher average molecular weight than the polydisperse polymer.

2. (amended) The process of claim 1 wherein the concentration of the multivalent aqueous soluble extraction salt is sufficient to cause two distinct phases to form at the selected temperature.

3. (amended) The process of claim 2 wherein the multivalent, aqueous soluble extraction salt is selected from the group consisting of sulfate, citrate, [or] and phosphate salts.

4. (amended) The process of claim 2 wherein the polydisperse water soluble polymer is [a polyol or] a polyether.

5. (withdrawn) The process of claim 4 wherein the polyol polymer is composed of ethylene oxide monomers joined by ether linkages.

6. (amended) The process of claim 4 wherein the [polyol] polyether polymer is a polyoxyalkylene block copolymer.

7. The process of claim 6 wherein the polyoxyalkylene block copolymer is a poloxamer.

8. (withdrawn) The process of claim 6 wherein the polyoxyalkylene block copolymer is a poloxamine.

9. The process of claim 4 wherein the multivalent, aqueous soluble extraction salt is ammonium sulfate.

10. (amended) The process of claim 9 wherein the concentrations of the polydisperse [polyol] polymer and ammonium sulfate, and the extraction temperature are adjusted so that the lower molecular weight [polyol] polymer molecules partition into the high salt concentration (lower) phase and the higher molecular weight [polyol] polymer molecules partition into the low salt concentration (upper) phase of the aqueous fractionation medium.

11. The process of claim 10 wherein the concentration of ammonium sulfate is about 5 to about 25% by weight of the solution.

12. (amended) The process of claim 10 wherein the concentration of the [polyol] polydisperse polymer may be up to 10% by weight of the extraction solution.

13. (amended)The process of claim 10 wherein the extraction temperature ranges from about –5 to about 30 [degree] degrees C.

14. (amended)The process of claim 10 wherein the extraction temperature ranges from about –2 to about 10 [degree] degrees C.

15. (amended) The process of claim 1 herein the polydispersity of the [resulting polyol] fractionated water soluble polymer is reduced.

16. (amended) The process of claim 1 wherein the viscosity of aqueous solutions of the [resulting polyol] fractionated water soluble polymer is increased between about 25 and about 40 [degree] degrees C.

17. The process of claim 1 wherein the viscosity of aqueous solutions of the [resulting polyol] fractionated water soluble polymer increases rapidly over a narrow temperature range.

18. (amended) [The process of claim 1 wherein the aqueous soluble extraction salt is replaced by an aqueous soluble polymer that is incompatible with the polymer that is to be fractionated.] A process for the fractionation or purification of polydisperse water soluble polymers that are composed of repeating units that do not contain functional groups capable of carrying a charge at neutral pH comprising:

a. dissolving a known amount of said polymer in water to form a clear solution,
b. equilibrating said solution at a temperature that allows the formation of an opaque solution when a second aqueous soluble polymer that is incompatible with the polymer to be fractionated is added to the solution,
c. adding to the solution a second aqueous soluble polymer that is incompatible with the polymer to be fractionated,
d. maintaining the solution at the temperature of step b until two phases form in the solution,
e. removing the phase that contains the incompatible polymer and the lower molecular weight molecules of the polydisperse water soluble polymer,
f. replacing the volume removed by adding water to the remaining solution,
g. repeating steps b through f the required number of times to cause the desired fractionation,
h. isolating the phase of the final extraction that contains the higher molecular weight molecules of the water soluble polymer to be fractionated,
i. removing the water to yield a fractionated polymer having a higher average molecular weight than the polydisperse polymer.

19. (amended) The process of claim 18 wherein the concentrations of the polydisperse water soluble polymer to be fractionated, and the incompatible polymer, and the extraction temperature are adjusted so that the extraction system forms two phases, and the lower molecular weight polymer molecules of the polydisperse water soluble polymer partition into the phase that contains the incompatible polymer.

20. (withdrawn) A purified water soluble polymer made by the process of claim 1.

21. (new) The process of claim 2 wherein the polydisperse, water soluble polymer is a polyol.